

Submillimeter-wave spectroscopy of nitrogen containing molecules of astrophysics interest

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Almost 30 nitrile molecules, which contain the cyano group ($C\equiv N$), have been detected in the interstellar medium (ISM) so far. The simplest of these nitriles, the cyano radical $C\equiv N$, was found in 1940 [1,2]. The most complex of all nitriles, $HC_{11}N$, having a total of 13 atoms, was detected in 1997 [3]. The vast majority of these nitriles have been detected in the dense molecular clouds Sgr A and B, and TMC-1 by means of their rotational spectra. The formation mechanisms of many of these compounds are not well understood.

In particular, many isocyanide compounds with a high kinetic instability, are poorly studied in laboratory. We investigated recently two of these compounds: diisocyanomethane, $CH_2(NC)_2$ [4], and allyl isocyanide, CH_2CHCH_2NC [5]. Following these studies we will report recent results about two others isocyanide: ethylisocyanide, CH_3CH_2NC , and iso-cyanomethane, $NCCH_2NC$. Like many others complex organic molecules of astrophysical interest some of the nitriles exhibit large amplitude motions that make delicate the analysis of their spectra. This is the case of hydroxyacetonitrile, $HOCH_2CN$, and acetyl isocyanate, CH_3CONCO , which are currently studied. The latest results on these two molecules will be also presented.

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